

Fourth Annual Conference on Carbon Capture & Sequestration

*Developing Potential Paths Forward Based on the
Knowledge, Science and Experience to Date*

Terrestrial – Science, Technology, & Economics

Terrestrial Carbon Pools in Southeast and South-central United States: State Level Inventories, Potentials, and Economic Impacts

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Introduction

- Detailed regional inventories of carbon sources and sinks are essential for assessing the potential roles of various carbon sequestration pools in mitigating the accumulation of CO₂ in the atmosphere and hence in preventing global warming.
- Such information is necessary for examining the economical feasibility of a particular technology and is a prerequisite for further development of systems of regional and national carbon emission trading or markets

Objectives

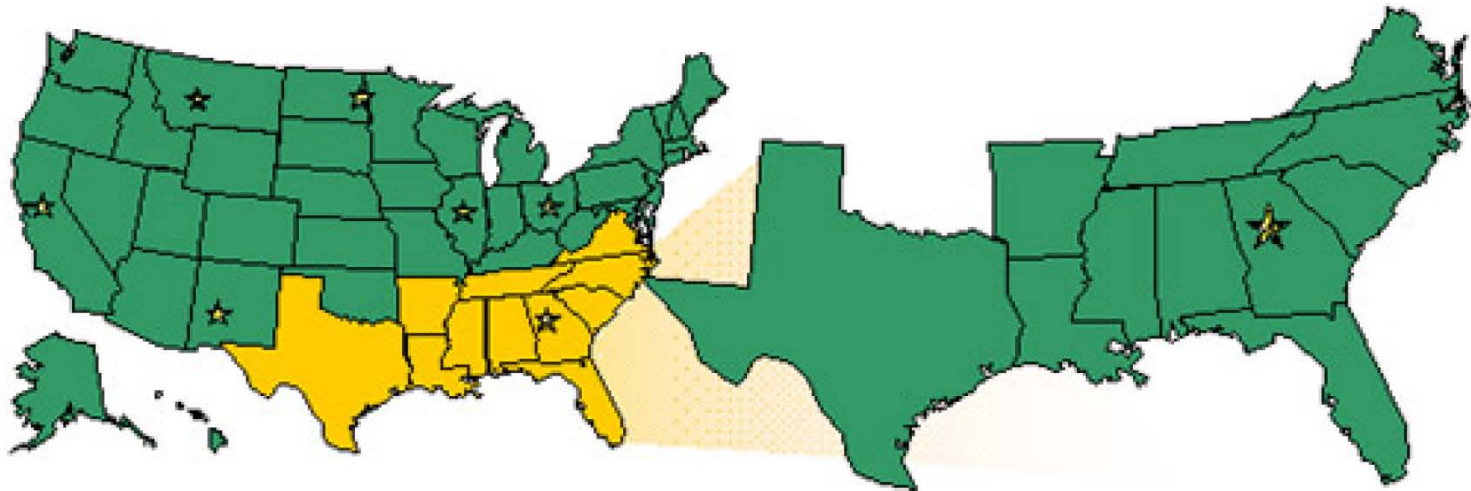
This study seeks to answer the following questions:

- What are the current annual rates of terrestrial carbon sequestration in each state of southeast and south-central US?
- What's the overall contribution of terrestrial carbon sequestration in each state of the region to mitigating its total greenhouse gas emission?
- What's the current baseline for possible carbon trading in the region?
- What's the potential of further enhancing terrestrial carbon sequestration in the region?
- What are the overall economic impacts of current and potential terrestrial carbon sequestration on the region?

Categories of Total Terrestrial Carbon

- Total terrestrial carbon storage in the region were estimated from the following major components:
 - Soil organic carbon pool
 - Forest biomass carbon pool
 - Crop biomass carbon pool
 - Grass biomass carbon pool
- The potentials of terrestrial carbon sequestration in the region were estimated from three categories:
 - Forestland
 - Cropland
 - Grassland

Southeast Regional Carbon Sequestration Partnership

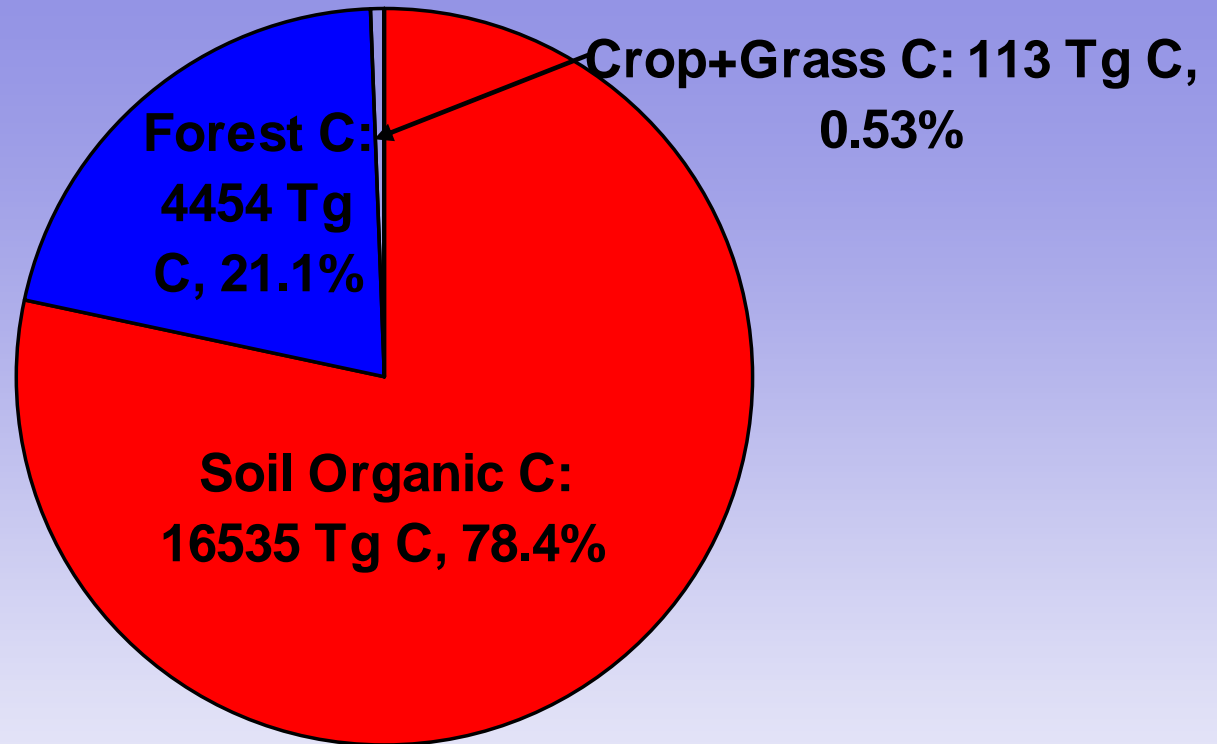


Region Covered:

Alabama
Florida
Louisiana
North Carolina
Tennessee
Virginia

Arkansas
Georgia
Mississippi
South Carolina
Texas





Total Terrestrial C Pools: 21102 Tg C

Fig. 1 Total terrestrial carbon storage in the region.

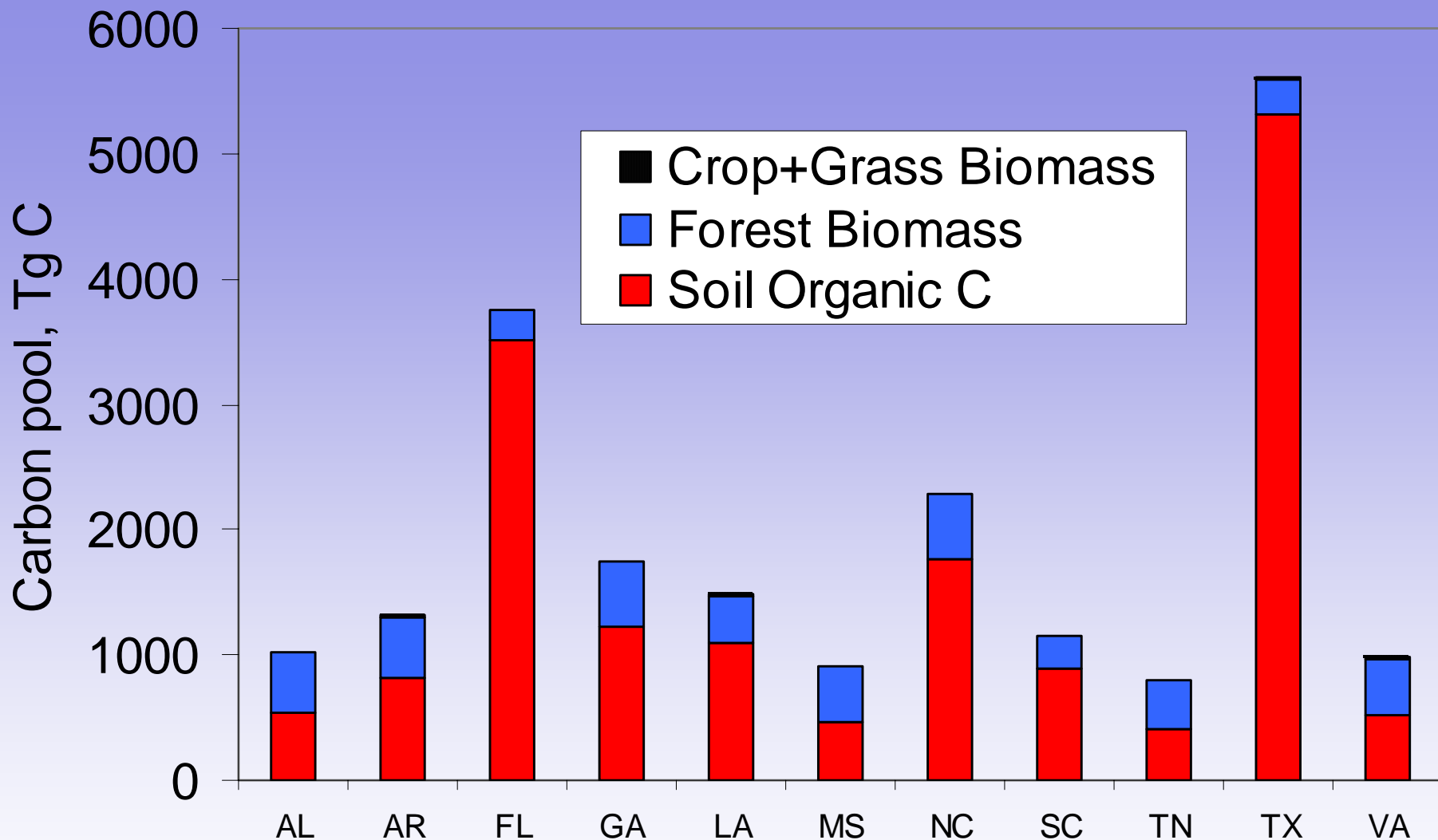
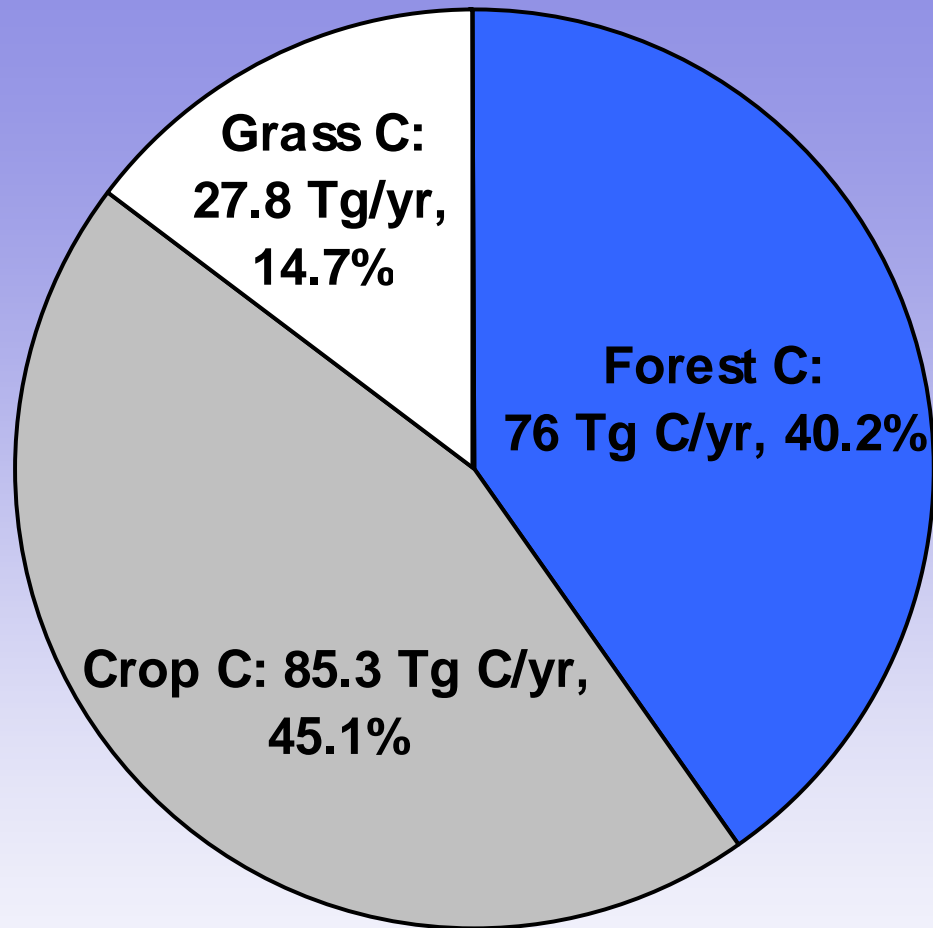


Fig. 2 Terrestrial carbon storage in each state.



Total Annual Terrestrial Biomass C Sink: 189.1 Tg C/yr

Fig. 3 Current annual biomass carbon sink in the region.

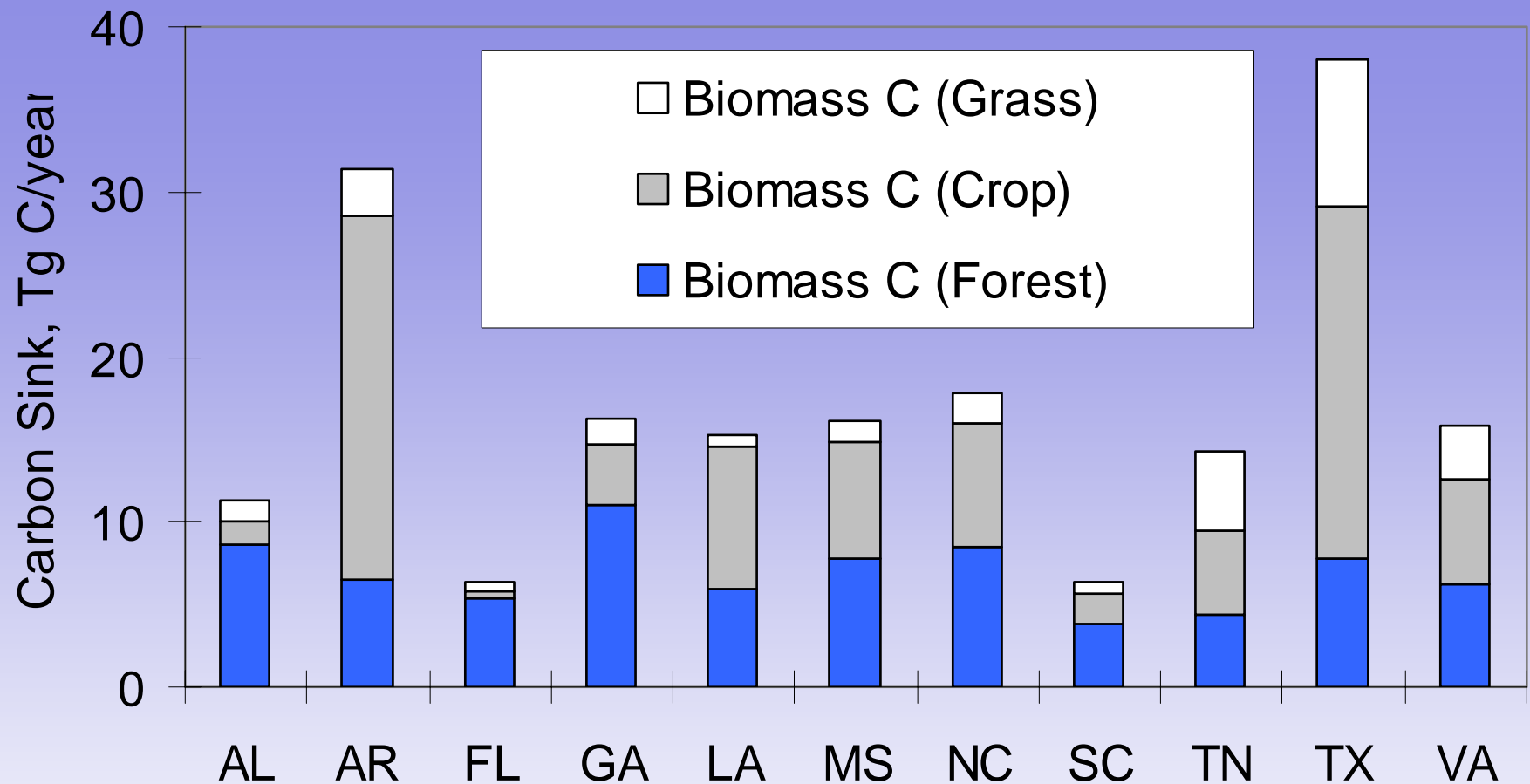


Fig. 4 Components of current annual biomass carbon sink in each state.

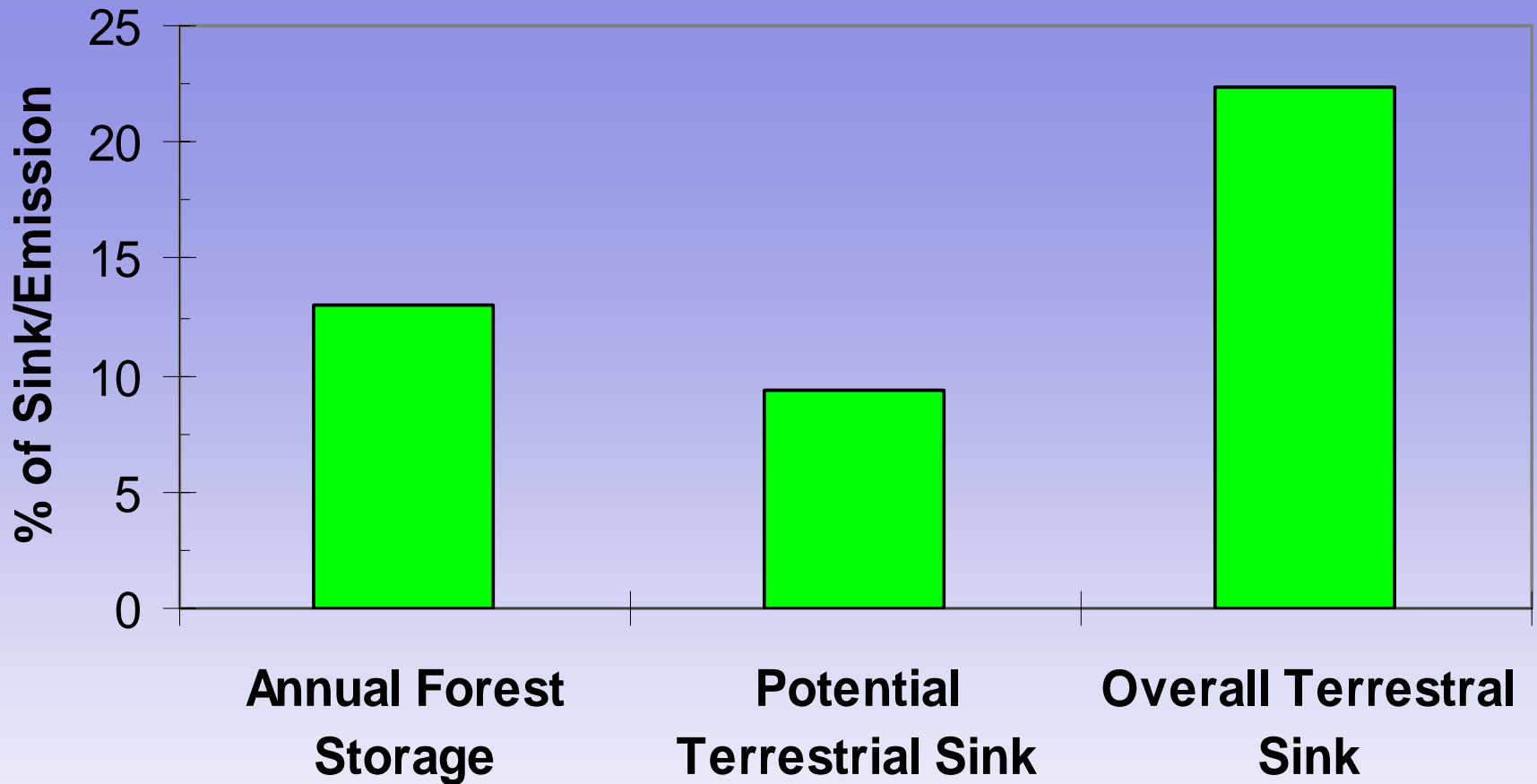


Fig. 6 Percentages of annual biomass carbon storage in forest, the potential terrestrial carbon storage, and overall carbon sink over the total greenhouse gas emission in the region. (AR and SC are excluded these two states).

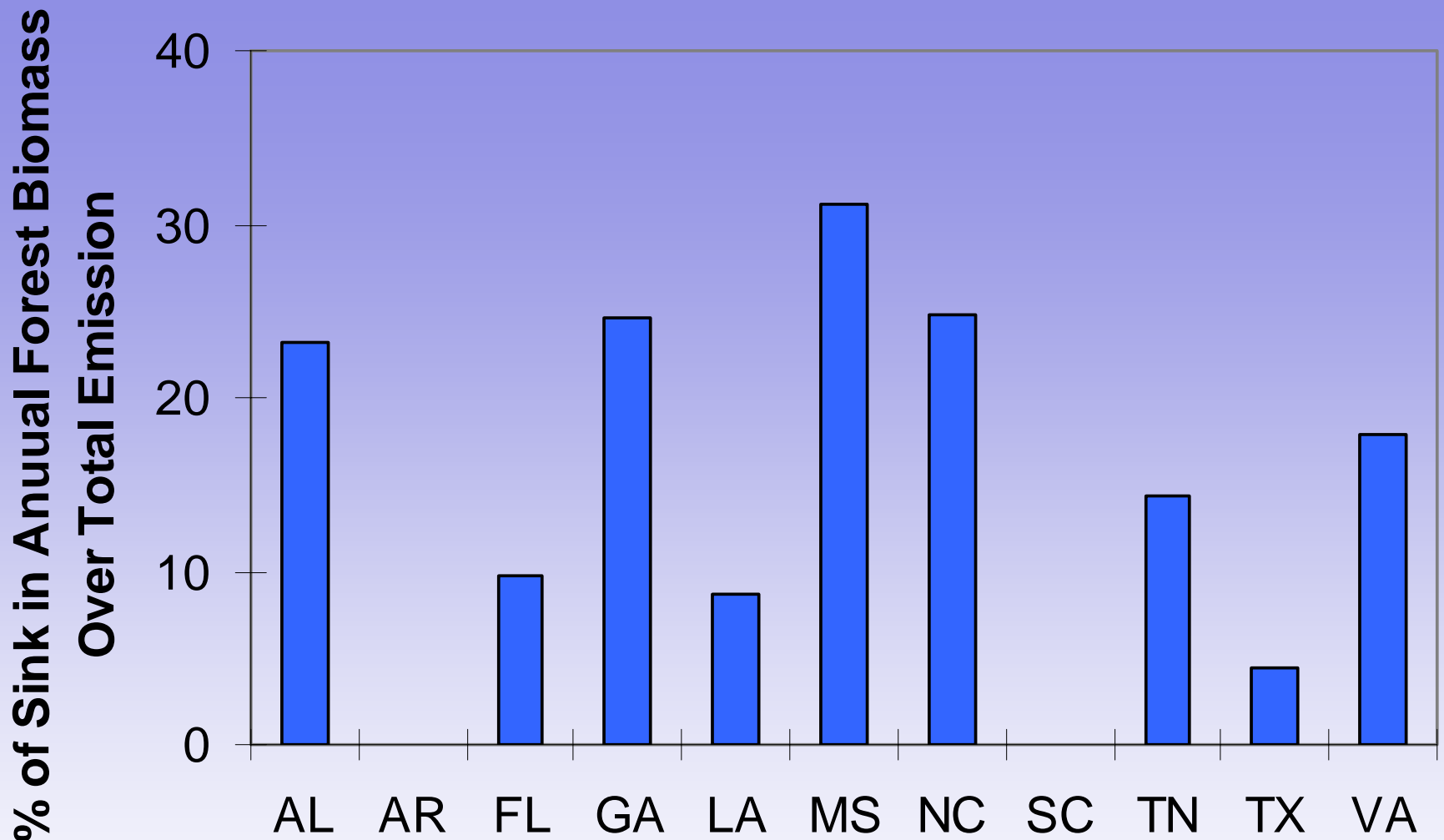
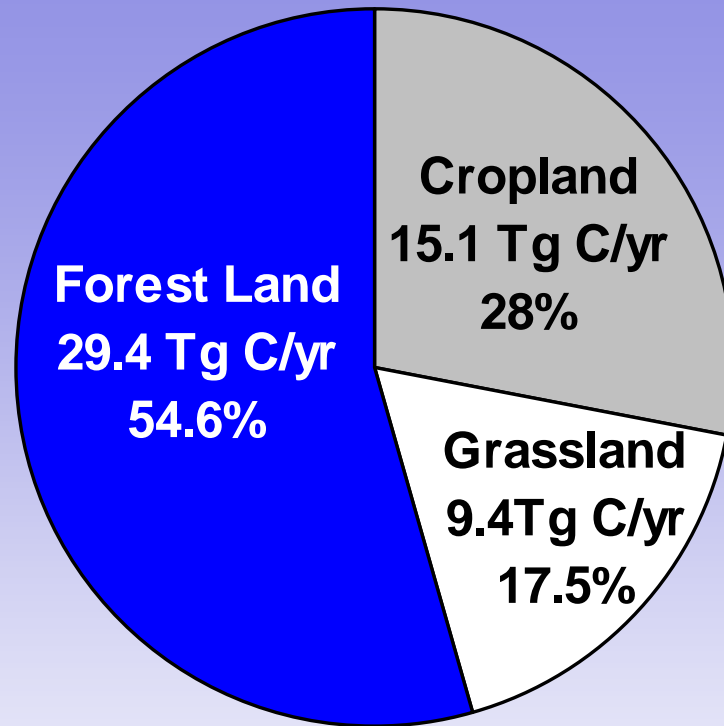


Fig. 7 Contributions (percentages) of annual forest biomass carbon sink to mitigation of total emission in each state. (Since total greenhouse gas emission in Arkansas and South Carolina is not available, the calculation excluded these two states).



Potential Annual C Sink: 53.9 Tg C/yr

Fig. 5 The potential terrestrial carbon sequestration in the region.

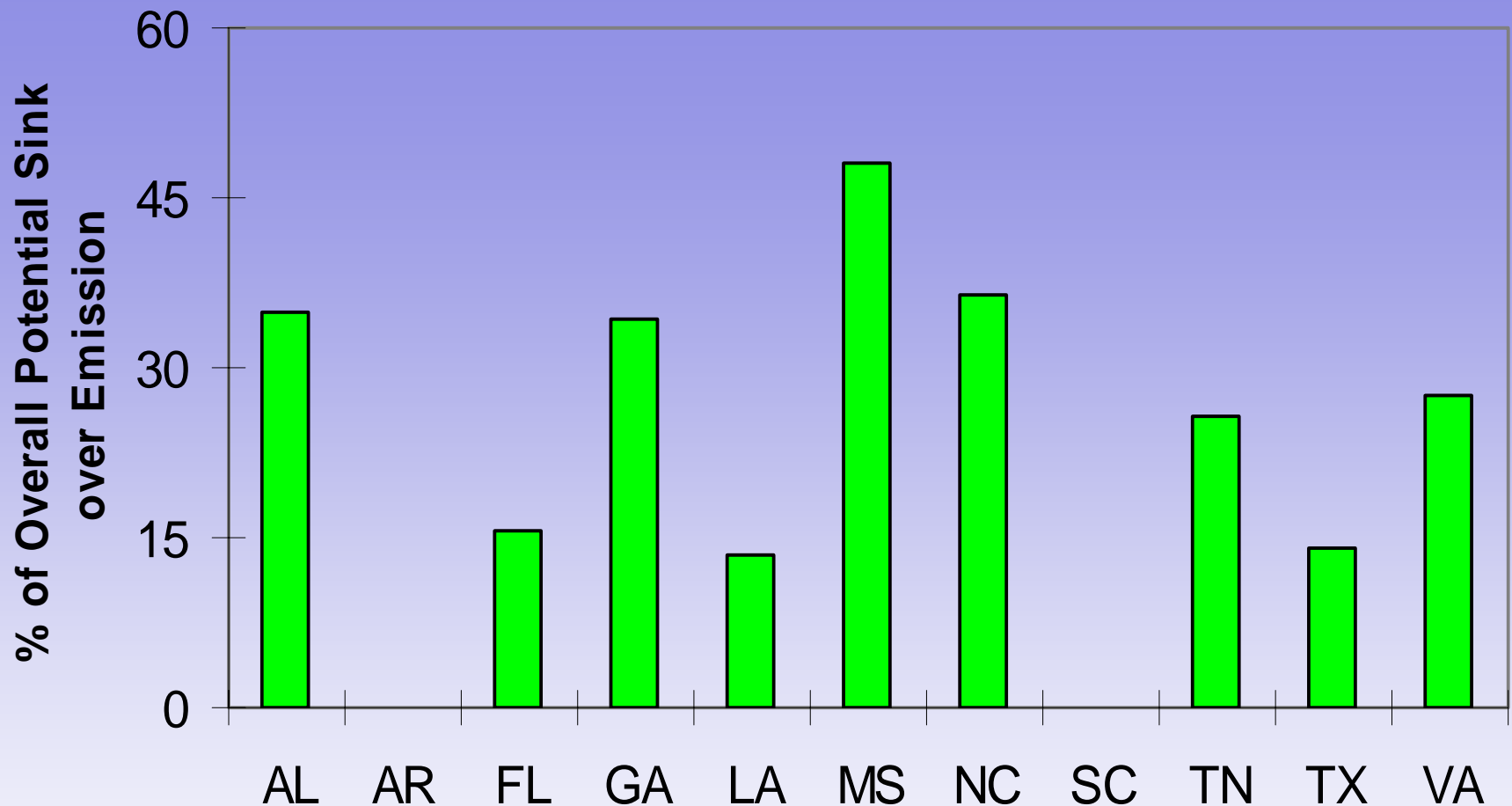


Fig. 8 Overall contribution of terrestrial carbon sequestration to mitigating total greenhouse gas emission in the region

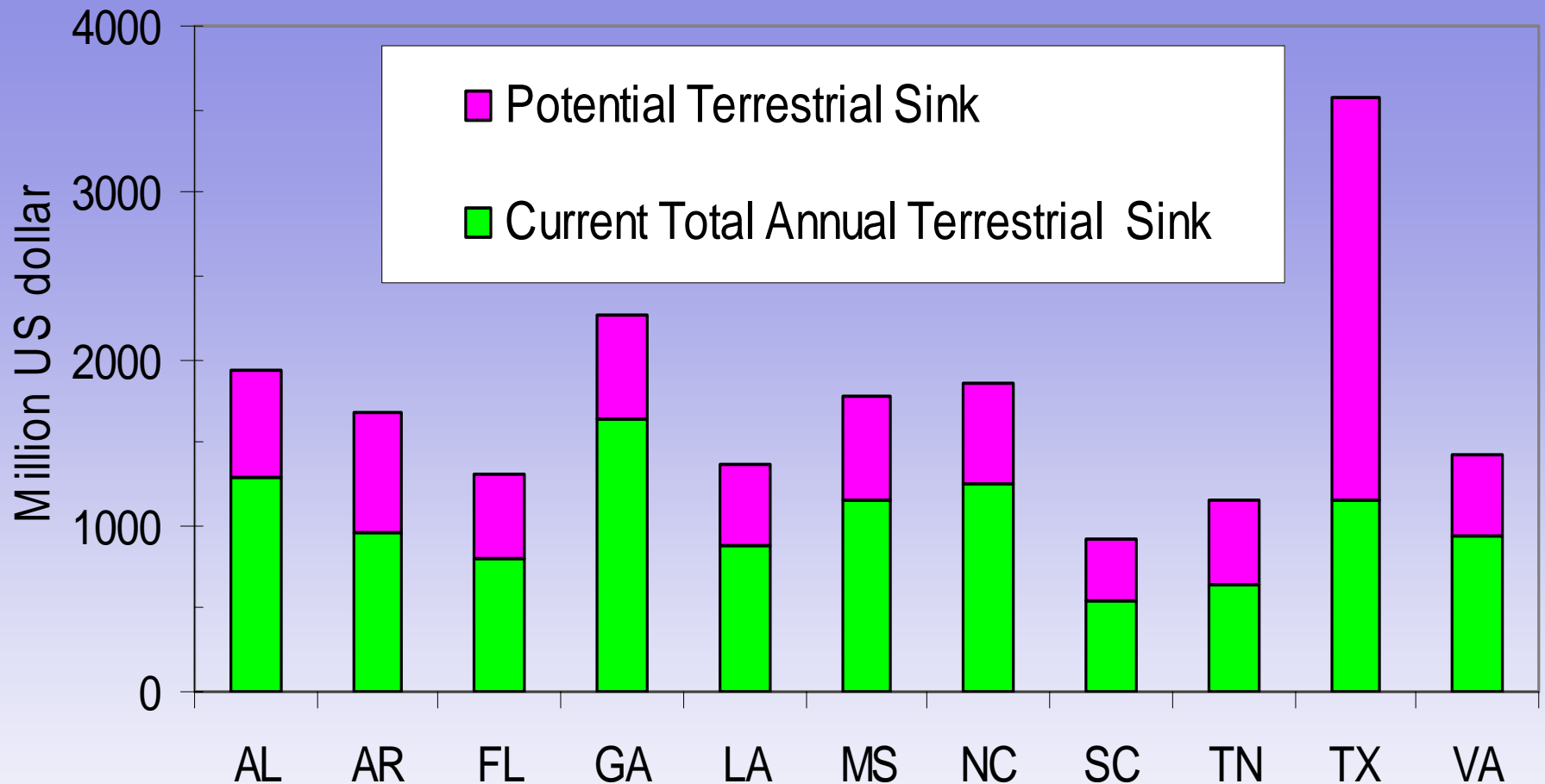


Fig. 9 Economic impacts of terrestrial carbon sequestration on the region.

Summary

- Current annual forest carbon sequestration in the region could offset 13% of the total annual greenhouse gas emission, which is equivalent to regional values of \$11.2 billion/year with current state-of-art separation, capture and sequestration technology.
- Based on estimated overall potential terrestrial carbon sequestration, TX has the largest annual carbon deficit (149 Tg C/year), followed by LA (59 Tg C/ year), and FL (47 Tg C/year), while MS has the smallest annual carbon deficit (13 Tg C/year).

- Through proper policies and best management, about another 9.3% of the total greenhouse gas in the region could be further offset by terrestrial sequestration, which could save the region about \$7.98 billion/year.
- Thus total value by current and potential annual terrestrial carbon sequestration in the region could reach \$19.2 billion/yr.

- MS is the leading states with the largest potential (16.8% of total annual emission by terrestrial storage). LA and FL have the smallest potential for terrestrial sequestration.
- Combined current annual rates and the potentials of terrestrial carbon sequestration, MS could have 48% of its annual greenhouse gas emission potentially offset by its annual terrestrial carbon sequestration, followed by North Carolina (36.6%), Alabama, and George (both 34-35%). FL, LA and TX have the smallest offset by terrestrial sequestration (13-16% of their annual emission). In other words, terrestrial carbon sequestration proves to be the most cost-effective option for sequestering carbon in the region.

Thanks!

Questions and Comments?